

What is claimed is:

1. A micro-mirror device for an image display apparatus, comprising:  
a substrate;  
a landing pad provided on the substrate;  
a pair of base electrodes provided on opposite sides of the landing pad;  
a pair of first posts that protrude from an upper surface of the landing pad, which are isolated from each other by a predetermined interval;  
a girder supported by the pair of first posts, which is operative to pivot toward sides of the base electrodes;  
10 a second post protruding from an upper surface of the girder; and  
a mirror supported by the second post, which reflects incident light, and receives power via the landing pad,  
wherein the mirror is pivoted toward the sides of the landing pad by an electrostatic attraction between the pair of base electrodes and the mirror.  
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2. The micro-mirror device for an image display apparatus of claim 1, wherein each of the pair of base electrodes has a protruding portion protruding inward to widen an area that faces the girder.

3. The micro-mirror device for an image display apparatus of claim 1, wherein the girder comprises:

a support plate for supporting the second post, the support plate having connecting portions which protrude from sides of the support plate in a direction parallel to a lengthwise direction of the pair of base electrodes and are point-symmetrical to each other on the basis of the second post; and  
5 a pair of springs which connect an upper surface of each of the pair of first posts to each of the connecting portions,  
wherein the pair of springs are elastically deformed when the mirror is vertically inclined by the electrostatic attraction between the mirror and the base electrodes.  
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4. The micro-mirror device for an image display apparatus of claim 3, wherein the girder further comprises:

landing tips protruding from opposite sides of the support plate, which contact the landing pad during pivoting.

5. The micro-mirror device for an image display apparatus of claim 1, wherein the pair of first posts have a height that is lower than a height of the second post, so that the mirror does not make an adhesive contact with the pair of base electrodes.

6. The micro-mirror device for an image display apparatus of claim 5, wherein the girder comprises:

5 a support plate for supporting the second post, the support plate having connecting portions which protrude from sides of the support plate in a direction parallel to a lengthwise direction of the pair of base electrodes and are point-symmetrical to each other on the basis of the second post; and

a pair of springs which connect an upper surface of each of the pair of first posts to each of the connecting portions,

10 wherein the pair of springs are elastically deformed in opposite directions when the mirror is vertically inclined by the electrostatic attraction between the mirror and the pair of base electrodes.

7. The micro-mirror device for an image display apparatus of claim 6, wherein the girder further comprises:

landing tips protruding from opposite sides of the support plate, which contact the landing pad during pivoting.

8. The micro-mirror device for an image display apparatus of claim 5, wherein each of the pair of base electrodes has a protruding portion protruding inward to widen an area that faces the girder.

9. The micro-mirror device for an image display apparatus of claim 1, wherein the mirror is pivoted around an axis that is parallel to a lengthwise direction of the pair of base electrodes.

10. A image display device, comprising:  
a plurality of micro-mirror devices, wherein each of the plurality of micro-mirror devices comprises:  
5 a substrate;  
a landing pad provided on the substrate;  
a pair of base electrodes provided on opposite sides of the landing pad;  
a pair of first posts that protrude from an upper surface of the landing pad, which are isolated from each other by a predetermined interval;  
10 a girder supported by the pair of first posts, which is operative to pivot toward sides of the base electrodes;  
a second post protruding from an upper surface of the girder;  
and  
15 a mirror supported by the second post, which reflects incident light, and receives power via the landing pad,  
wherein the mirror is pivoted toward the sides of the landing pad by an electrostatic attraction between the pair of base electrodes and the mirror.

11. The image display device of claim 10, wherein the plurality of micro-mirror devices are arrayed to form a two-dimensional structure.

12. The image display device of claim 10, wherein an area ratio of each of the plurality of micro-mirror devices is controlled by the electrostatic attraction between the pair of base electrodes and the mirror.

13. A method of reflecting light using a micro-mirror device in an image display apparatus, comprising:

supplying a driving voltage to at least one of a pair of base electrodes of the micro-mirror device;

5 creating an electrostatic attraction between the at least one of the pair of the base electrodes and a mirror, wherein the mirror is pivoted around an axis formed in a lengthwise direction of the pair of base electrodes; and

10 altering the driving voltage which is supplied to the at least one of the pair of base electrodes so that a reflection angle of light incident upon the mirror is controlled.

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